

Patent Claims

Tool for a ultrasonic welding device

- 5 1. Tool for an ultrasonic welding device, covering a working surface (28, 30) preferably limited by a compression chamber, as well as empty surfaces running in particular perpendicular to this, such as a front surface (32), whereby the working surface runs parallel or somewhat parallel to the longitudinal axis of the tool, thus characterized, that the tool exhibits at least one reinforcement (34, 36, 38) for reducing deflection of the
10 working surface (28, 30) perpendicular to the longitudinal axis (40) of the tool.
- 15 2. Tool according to Claim 1, in the form of a sonotrode (22), which transfers ultrasonic oscillations with at least one working surface (28, 30) for welding metal with ultrasonic oscillations running in the direction of the sonotrode's longitudinal axis (40), whereby the front surface (32) of the sonotrode, which runs from its sonotrode head (26) perpendicular or essentially perpendicular to at least one working surface, characterized in that the front surface (32) of the sonotrode (22) and/or the back of the sonotrode head (26) exhibits at least one reinforcement (34, 36, 38).
- 20 3. Tool according to Claim 1 or Claim 2, characterized in that the reinforcement (34, 36, 38) is a rib.
- 25 4. Tool according to least one of the preceding claims, characterized in that the reinforcement (36) exhibits triangle geometry in a section of the sonotrode's longitudinal axis.
- 30 5. Tool according to at least one of the preceding claims, characterized in that the reinforcement (36, 38) protrudes from the peripheral edge of the front surface (32), of the working surface (28, 30), respectively, of the sonotrode (22) starting in the direction of the sonotrode's longitudinal axis (40) incrementally over the front surface (32).

6. Tool according to at least one of the preceding claims, characterized in that the reinforcement (36, 38), in particular, runs perpendicular to the working surface (28, 30).

7. Tool according to at least one of the preceding claims, characterized in that the reinforcement (36, 38) is trained in a linear manner.

5

8. Tool according to at least one of the preceding claims, characterized in that the reinforcement (36, 38) projects from the entire, or essentially entire, front surface (32).

10

9. Tool according to at least one of the preceding claims, characterized in that the reinforcement (36, 38) is trained symmetrically to a symmetry plane, in which the sonotrode's longitudinal axis (40) runs.

15

10. Tool according to at least one of the preceding claims, characterized in that the reinforcement (38) is trained in a beaded manner, as a beam in a linear manner, respectively.

11. Tool according to at least one of the preceding claims, characterized in that the sonotrode (22) is reinforced in such a way that, with ultrasonic excitation, deflection a_z of the sonotrode, acts in the direction of its longitudinal axis (40) by deflecting a_y perpendicular to the working surface (28, 30), as $3 \leq a_z / a_y \leq 20$.

20

12. Tool according to at least one of the preceding claims, characterized in that the maximal extension d of the reinforcement (36, 38), over the front surface (32) is $3 \text{ mm} \leq d \leq 25 \text{ mm}$, preferably $5 \text{ mm} \leq d \leq 15 \text{ mm}$.

25

13. Tool according to at least one of the preceding claims, characterized in that the extension d of the reinforcement (36, 38), over the front surface (32), is maximally 10 mm.

30